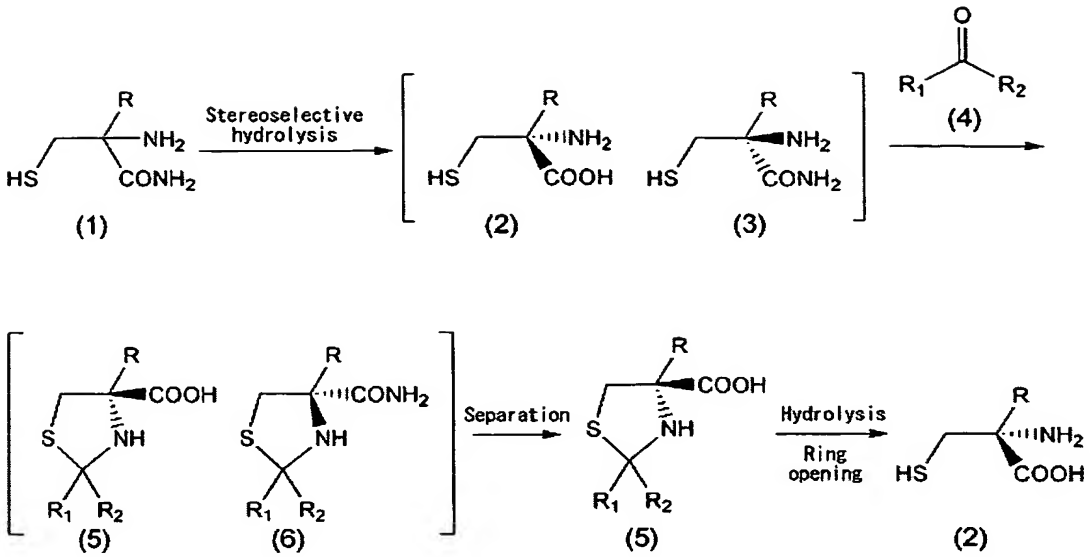
CLAIMS

1. A process for producing an optically active 2-alkyl-L-cystein or a salt thereof from a 2-alkylcysteinamide or a salt thereof, which comprises allowing cells of microorganism or a treated product thereof having an activity of stereoselective hydrolysis of the amide bond of a 2-alkyl-L-cysteinamide or a salt thereof to act on a 2-alkylcysteinamide represented by the general formula (1) or a salt thereof, so as to generate a 2-alkyl-L-cysteine represented by the general formula (2) or a salt thereof;

allowing the generated 2-alkyl-L-cysteine or salt thereof and an unreacted 2-alkyl-D-cysteinamide represented by the general formula (3) or a salt thereof to react with an aldehyde or ketone represented by the general formula (4), or an acetal or ketal thereof, so as to derive therefrom a 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (5) or a salt thereof and a 4-alkylthiazolidine-4-carboxamide represented by the general formula (6) or a salt thereof, respectively;

separating the 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (5) or salt thereof from the mixture thereof; and

hydrolyzing it for ring-opening to yield an optically active 2-alkyl-L-cysteine represented by the general formula (2) or a salt thereof,



where in the general formulas (1), (2), (3), (5) and (6), R represents a C_{1-4} lower alkyl; and in the general formulas (4), (5) and (6), each of R_1 and R_2 independently represents hydrogen or a C_{1-4} lower alkyl, or R_1 and R_2 bind to each other to form a 5- to 8-membered alicyclic structure, provided that R_1 and R_2 do not simultaneously represent hydrogen.

2. A process for producing an optically active 2-alkyl-D-cystein or a salt thereof from a 2-alkylcysteinamide or a salt thereof, which comprises

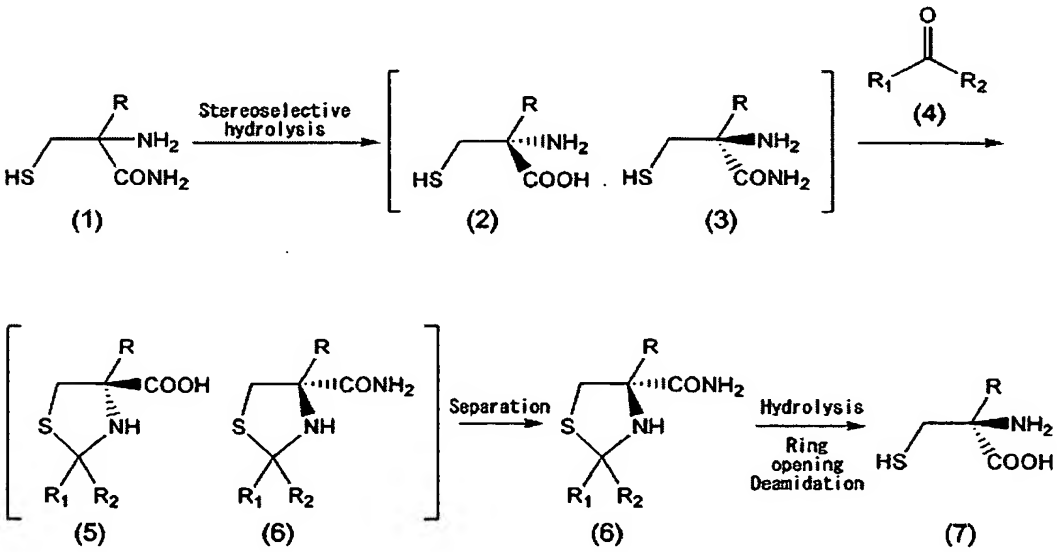
allowing cells of microorganism or a treated product thereof having an activity of stereoselective hydrolysis of the amide bond of a 2-alkyl-L-cysteinamide or a salt thereof to act on a 2-alkylcysteinamide represented by the general formula (1) or a salt thereof, so as to

generate a 2-alkyl-L-cysteine represented by the general formula (2) or a salt thereof;

allowing the generated 2-alkyl-L-cysteine or salt thereof and an unreacted 2-alkyl-D-cysteinamide represented by the general formula (3) or a salt thereof to react with an aldehyde or ketone represented by the general formula (4), or an acetal or ketal thereof, so as to derive therefrom a 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (5) or a salt thereof and a 4-alkylthiazolidine-4-carboxamide represented by the general formula (6) or a salt thereof, respectively;

separating the 4-alkylthiazolidine-4-carboxamide represented by the general formula (6) or salt thereof from the mixture thereof; and

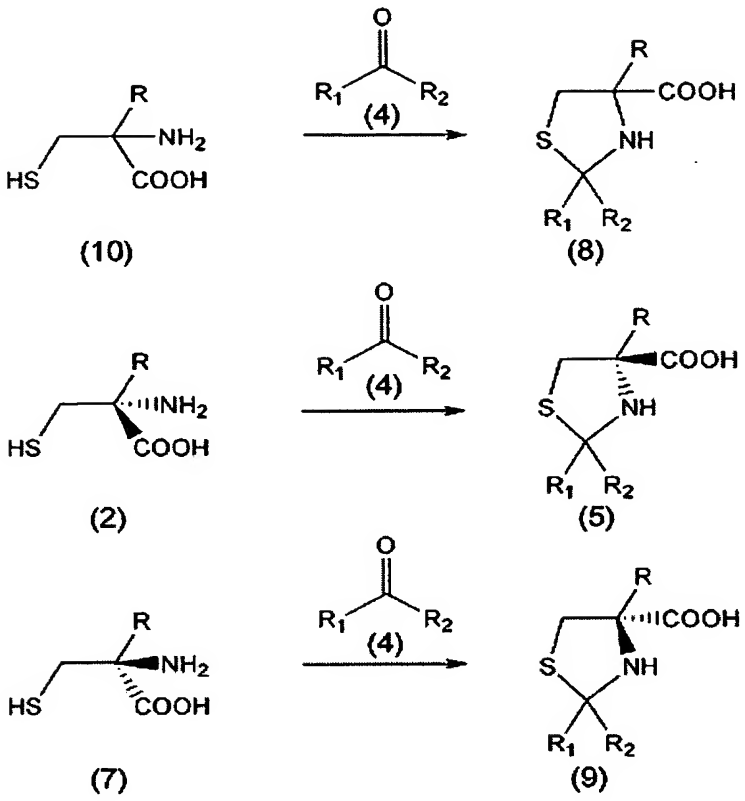
hydrolyzing it for ring-opening and amide hydrolysis to yield an optically active 2-alkyl-D-cysteine represented by the general formula (7) or a salt thereof,



where in the general formulas (1), (2), (3), (5), (6) and (7), R represents a C_{1-4} lower alkyl; and in the general formulas (4), (5) and (6), each of R_1 and R_2 independently represents hydrogen or a C_{1-4} lower alkyl, or R_1 and R_2 bind to each other to form a 5- to 8-membered alicyclic structure, provided that R_1 and R_2 do not simultaneously represent hydrogen.

3. A process for producing a 4-alkylthiazolidine-4-carboxylic acid or a salt thereof, or an optically active 4-alkylthiazolidine-4-carboxylic acid or a salt thereof, which comprises

allowing a 2-alkylcysteine represented by the general formula (10) or a salt thereof, an optically active 2-alkyl-L-cysteine represented by the general formula (2) or a salt thereof, or an optically active 2-alkyl-D-cysteine represented by the general formula (7) or a salt thereof to react with an aldehyde or ketone represented by the general formula (4), or an acetal or ketal thereof, so as to derive therefrom a 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (8) or a salt thereof, or an optically active 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (5) or (9) or a salt thereof,



where in the general formulas (2), (5), (7), (8), (9) and (10), R represents a C_{1-4} lower alkyl; and in the general formulas (4), (5), (8) and (9), each of R_1 and R_2 independently represents hydrogen or a C_{1-4} lower alkyl, or R_1 and R_2 bind to each other to form a 5- to 8-membered alicyclic structure, provided that R_1 and R_2 do not simultaneously represent hydrogen.

4. The process according to claim 1 or 2, wherein the microorganism having an activity of stereoselective hydrolysis of the amide bond of a 2-alkyl-L-cysteinamide or a salt thereof is a bacterium which belongs the genus

Xanthobacter, the genus Protaminobacter, or the genus Mycoplana.

5. The process according to any of claims 1 to 3, wherein said R represents methyl.

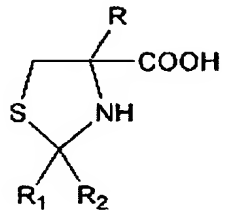
6. The process according to any of claims 1 to 3, wherein said R_1 and R_2 both represent methyl.

7. The process according to any of claims 1 to 3, wherein a basic catalyst is used when the 2-alkyl-L-cysteine represented by the general formula (2) or salt thereof, the 2-alkyl-D-cysteinamide represented by the general formula (3) or salt thereof, the 2-alkyl-D-cysteine represented by the general formula (7) or salt thereof, or the 2-alkylcysteine represented by the general formula (10) or a salt thereof is allowed to react with the aldehyde or ketone represented by the general formula (4), or an acetal or ketal thereof.

8. The process according to any of claims 1 to 3, wherein a dehydrating agent is used when the 2-alkyl-L-cysteine represented by the general formula (2) or salt thereof, the 2-alkyl-D-cysteinamide represented by the general formula (3) or a salt thereof, the 2-alkyl-D-cysteine represented by the general formula (7) or salt thereof, or the 2-alkylcysteine represented by the

general formula (10) or salt thereof, is allowed to react with the aldehyde or ketone represented by the general formula (4), or an acetal or ketal thereof.

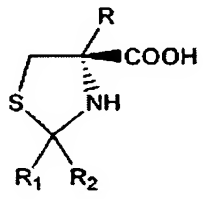
9. A 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (8) or a salt thereof:



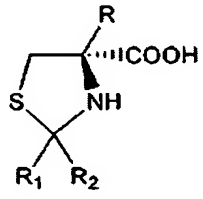
(8)

where in the general formula (8), R represents a C_{1-4} lower alkyl; and each of R_1 and R_2 independently represents hydrogen or a C_{1-4} lower alkyl, or R_1 and R_2 bind to each other to form a 5- to 8-membered alicyclic structure, provided that R_1 and R_2 do not simultaneously represent hydrogen.

10. An optically active 4-alkylthiazolidine-4-carboxylic acid represented by the general formula (5) or (9) or a salt thereof:



(5)



(9)

where in the general formulas (5) and (9), R represents a C_{1-4} lower alkyl; and each of R_1 and R_2 independently represents hydrogen or a C_{1-4} lower alkyl, or R_1 and R_2 bind to each other to form a 5- to 8-membered alicyclic structure, provided that R_1 and R_2 do not simultaneously represent hydrogen.

11. The compound according to claim 9 or 10, wherein said R represents methyl.

12. The compound according to claim 9 or 10, wherein said R_1 and R_2 both represent methyl.